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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SCHEIBEL, ROBERT C	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/089,326	ARRAKOSKI ET AL.	
	Examiner	Art Unit	
	ROBERT C. SCHEIBEL	2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *36-88* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *36-88* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

- Examiner acknowledges receipt of Applicant's Request for Continued Examination (RCE) filed 1/22/2008.
- Claims 36-45, 49-63, 67-79, and 83-88 are currently amended.
- Claims 36-88 are currently pending.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/22/2008 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 36-88 have been considered but are moot in view of the new grounds of rejection.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re*

Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims **36, 52, 53, 54, 70, 86, 87, and 88** are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims **4 and 24** of copending Application No. 09/833,868. Although the conflicting claims are not identical, they are not patentably distinct from each other as explained below.

Regarding claim **36** of the instant application, claim 4 of copending Application No. 09/833,868 discloses the limitations of claim 36 of the instant application as follows:

a first mesh network tier comprising a plurality of first network subscriber units and a first network sink node unit configured to wirelessly communicate with the first network subscriber units (the first-tier mesh of claim 1 including a first-tier sink node; the limitation that the communication is wireless is disclosed in the radio communication limitation of claim 1); and

the second mesh network tier geographically at least partly overlapping the fist network and comprising a plurality of second mesh network tier subscriber units and a second mesh network tier sink node unit configured to wirelessly communicate with the second mesh network tier subscriber units (the second-tier mesh of claim 1 including a second-tier sink node; the

limitation that the communication is wireless is disclosed in the radio communication limitation of claim 1); and

a connection between the first mesh network sink node unit and a second mesh network tier unit configured to communicate in the second network, whereby one of the first network subscriber units is configured to be provided with a communication path via the first mesh network tier sink node unit to said second mesh network tier unit (the limitation of claim 4 which indicates that at least selected first-tier nodes are configured to communicate with the first-tier sink node and through it to second-tier nodes).

Claim 36 of the instant application is broader than claim 4 of copending Application No. 09/833,868 in that claim 36 doesn't explicitly include the limitation that the wireless communication is radio communication. However, it would have been obvious to one of ordinary skill to eliminate this limitation from claim 4 of copending Application No. 09/833,868 to obtain the invention as specified in claim 36 of the instant application.

Regarding claims **52, 54, 70, 87, and 88** of the instant application, claim 4 of copending Application No. 09/833,868 similarly discloses the limitations of these claims and these claims are similarly rejected.

Regarding claims **53 and 86** of the instant application, claim 24 of copending Application No. 09/833,868 similarly discloses the limitations of these claims and these claims are similarly rejected.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Objections

5. Claims **41, 52, 75, 87, and 88** are objected to because of the following informalities:

Examiner objects to the use of "capable of communication" and "capable of wireless communication" because it can be interpreted as an optional requirement and not a positive recitation of communication or wireless communication. Examiner requests that Applicant either amend the claims to a positive recitation or provide arguments that these claims in fact positively recite the limitations in question.

Appropriate correction is required.

6. Claims **36, 41, and 54** are objected to because of the following informalities:

These claims contain the phrases "the first network" and "the second network" which should be corrected to "the first mesh network tier" and "the second mesh network tier".

Appropriate correction is required.

7. Claim **70** is objected to because of the following informalities:

The phrase "operable as" in line 7 and the phrase "of operation as" in line 9 do not make sense as they are currently used. They should be changed to be consistent with one another.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims **52, 53, and 70-88** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim **41** recites the limitation "the primary third mesh network tier unit" in lines 5-6. There is insufficient antecedent basis for this limitation in the claim.

Claim **52** is indefinite for a number of reasons which are detailed below.

- First, the claim is drawn towards a communications unit, but does not indicate any structural elements which comprise the communications unit.
- Second, the claim is written in narrative form and appears to claim both a communications unit as well as a communications system.
- Further, the claim indicates that the communications unit comprises a connection to a second network unit; it is unclear how the apparatus can comprise a connection as well as what within the unit will establish this connection. Applicant must rewrite this claim to clearly define the subject matter sought to be described.

Claim **53** is indefinite as it does not clearly identify the steps which comprise the method.

- The claim needs to be rewritten such that the limitations defining the system in which the method operates are more clearly distinguished from the steps of the method itself.

Claim **70** is indefinite for a number of reasons which are detailed below.

- First, the claim is drawn towards a communications unit, but does not indicate any structural elements which comprise the communications unit.
- Second, the claim is written in narrative form and appears to claim both a communications unit as well as a communications system.
- Further, the claim indicates that the communications unit comprises a connection to a second network unit; it is unclear how the apparatus can comprise a connection as well as what within the unit will establish this connection. Applicant must rewrite this claim to clearly define the subject matter sought to be described.

Claims **71-85** are indefinite as they depend from claim 70 which is drawn towards a communications unit, but the limitations specified in these dependent claims appear to modify the system in which the communications unit operates rather than the communications unit itself.

Claim **86** is indefinite as it does not clearly identify the steps which comprise the method.

- The claim needs to be rewritten such that the limitations defining the system in which the method operates are more clearly distinguished from the steps of the method itself.

Claim **87** is indefinite for a number of reasons which are detailed below.

- First, the claim is drawn towards a processor configured to execute a computer program at a communications unit, but does not indicate any structural elements which comprise the processor.
- Second, the claim is written in narrative form and appears to claim a processor as well as a communications system and a computer program.

Claim **88** is indefinite for a number of reasons which are detailed below.

- First, the claim is drawn towards a controller for a communications unit, but does not indicate any structural elements which comprise the controller.
- Second, the claim is written in narrative form and appears to claim both a controller for a communications unit as well as a communications system.

Claim Rejections - 35 USC § 101

10. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim **87** is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Although the claim is drawn towards a processor, the claim appears to be attempting to claim a disembodied computer program per se. The claim starts by claiming a processor and continues with limitations which modify the communications unit and the communications system in which the communications unit operates. However, the main portion of the claim merely specifies what the computer program is configured to do. The claim

does not in any way specify that the computer program is embodied or stored in any physical medium such as a computer-readable medium.

As indicated in pages 50-55 of "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility", functional descriptive material (such as a computer program) is non-statutory when claimed as descriptive material *per se*. Since this claim appears to be claiming the functional descriptive material per se as opposed to claiming it structurally and functionally interrelated as part of a physical medium, the claim is rejected as being directed to non-statutory subject matter.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims **36, 37, 46, 47, 49, 50, 52-55, 67, 68, 70, 71, 83, 84, and 86-88** are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,304,556 to Haas.

Regarding claim **36**, Haas discloses a communications system comprising: a hierarchical mesh network comprising at least a first mesh network tier and a second mesh network tier (shown in Figure 3):

the first mesh network tier (tier-1 network 24 of Figure 3) comprising a plurality of first network subscriber units (the nodes shown in tier-1 network 24 of Figure 3) and a first network

sink node unit (cluster head CH1) configured to wirelessly communicate with the first network subscriber units (see lines 30-31 of column 2); and

the second mesh network tier (tier-2 network 32 of Figure 3) geographically at least partly overlapping the first network (Figure 3 indicates that these networks at least partially geographically overlap) and comprising a plurality of second mesh network tier subscriber units (CH1, CH2, CH4 of Figure 3) and a second mesh network tier sink node unit (CH3 which is indicated as the cluster head of network 32) configured to wirelessly communicate with the second mesh network tier subscriber units (see lines 30-31 of column 2) ; and

a connection between the first mesh network tier sink node unit and a second mesh network tier unit configured to communicate in the second network (CH1 is the first mesh network sink node unit and it is connected to CH2 which is a second mesh network tier unit), whereby one of the first network subscriber units is configured to be provided with a communication path via the first mesh network tier sink node unit to said second mesh network tier unit (see lines 50-59 of column 8).

Regarding claims **52 and 53**, Haas similarly discloses the analogous limitations of these claims.

Regarding claim **54**, Haas discloses a communications system comprising a hierarchical mesh network comprising at least a first mesh network tier and a second mesh network tier (shown in Figure 3):

a first mesh network tier (tier-1 network 24 of Figure 3) comprising a first sink node (cluster head CH1) and a plurality of first communication terminals (the nodes shown in tier-1

network 24 of Figure 3) configured to wirelessly communicate with the first sink node (see lines 30-31 of column 2);

a second mesh network tier (tier-2 network 32 of Figure 3) geographically at least partly overlapping the first network (Figure 3 indicates that these networks at least partially geographically overlap) and comprising a second sink node (CH3 which is indicated as the cluster head of network 32) and a plurality of second communication terminals (CH1, CH2, CH4 of Figure 3) configured to wirelessly communicate with the second sink node (see lines 30-31 of column 2);

wherein the first sink node is further configured to operate as a second communication terminal for providing one of the first communication terminals with communications access to the second mesh network tier (see lines 50-59 of column 8).

Regarding claims **70, 86, 87, and 88**, Haas similarly discloses the analogous limitations of these claims.

Regarding claim **37, 55, and 71**, Haas discloses the limitation that wireless communication in the first mesh network tier is independent of wireless communication in the second mesh network tier (see lines 45-46 of column 8).

Regarding claims **46**, Haas discloses throughout the limitation that the communication is data communication. Consider, for example, the discussion in lines 14-36 of column 3 which discussed routing packets which clearly contain data of some type.

Similarly, regarding claim **47**, Haas discloses the limitation that the communication is packet data communication. Again, consider the discussion in lines 14-36 of column 3 which discussed routing packets which clearly contain data of some type.

Regarding claims **49, 67, and 83**, Haas discloses the limitation that said communication in the first mesh network tier is radio communication (see claims 30-34 of column 2).

Regarding claims **50, 68, and 84**, Haas discloses the limitation that said communication in the second mesh network tier is radio communication (see claims 30-34 of column 2).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims **38, 39, 40, 48, 56, 57, 58, 66, 72, 73, 74, and 82** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,304,556 to Haas in view of U.S. Patent 6,751,455 to Acampora.

Regarding claims **38, 56, and 72,** Haas discloses all limitations of parent claims 37, 55, and 71. However, Haas does not disclose expressly the limitation that wireless communication in the first mesh network tier is in a different frequency band from wireless communication in the second mesh network tier.

Acampora discloses the concept of using separate frequencies in each tier of a two-tier network architecture in lines 58-65 of column 6. Haas and Acampora are analogous art because they are from the same field of endeavor of wireless ad hoc networking. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Haas to use a different frequency in each tier of the network. The motivation for doing so would have been to allow communications at the two tiers to remain separate and not interfere with each other. Therefore, it would have been obvious to combine Acampora with Haas for the benefit of minimizing interference between the tiers to obtain the invention as specified in claims 38, 56, and 72.

Regarding claims **39, 57, and 73,** Haas and Acampora disclose the limitations of parent claims 38, 56, and 72, as indicated above. However, Haas does not disclose the limitation that the first mesh network tier comprises a plurality of first network sink node units with which the first mesh network tier subscriber units are configured to wirelessly communicate.

Acampora discloses the concept of multiple sink nodes in a tier throughout. In Acampora, the agents are the sink nodes at the first tier and Acampora suggests the use of "one or more proximately-located agents" in the abstract, for example. Haas and Acampora are analogous art because they are from the same field of endeavor of wireless ad hoc networking.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Haas to use a plurality of sink nodes in the first tier. The motivation for doing so would have been make the network more robust in the event of a failure of a sink node as well as to reduce the capacity requirements placed upon a single sink node. Therefore, it would have been obvious to combine Acampora with Haas for the benefit of improved robustness and capacity to obtain the invention as specified in claim 39, 57, and 73.

Regarding claims **40, 58, and 74**, Haas discloses the limitation that the system comprises a plurality of connections, each connection being between a respective first mesh network tier sink node unit and a respective second mesh network tier unit whereby one of the first mesh network tier subscriber units is configured to be provided with a communication path via the respective first mesh network tier sink node to respective second mesh network tier unit (see the plurality of connections in Figure 3 between first tier sink node CH 1 and second tier units CH 2 and CH 4, for example).

Regarding claim **48, 66, and 82**, Haas discloses that the communication is packet data communications, but does not expressly disclose that it uses an internet protocol. Haas suggests that this may be a means of interconnecting separate ad hoc networks in lines 3-9 of column 2. Acampora discloses connecting the two-tiered network to the Internet which discloses the limitation that the communication uses an internet protocol. At the time of the invention, it would have been obvious to one or ordinary skill in the art to use an internet protocol with the

Haas system. The motivation for doing so would have been to allow the clients in Haas to communicate easily with users outside the ad hoc network.

16. Claims **41-45, 51, 59-65, 69, 75-81, and 85** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,304,556 to Haas in view of U.S. Patent 6,751,455 to Acampora and in further view of U.S. Patent 6,980,537 to Liu.

Regarding claims **41, 59 and 75,** the combination of Haas and Acampora discloses the limitations of parent claims 40, 58, and 76, respectively. However, the combination of Haas and Acampora does not disclose expressly the limitations of claim 41 involving a third mesh tier.

Liu discloses the concept of a third network tier in Figure 8. Liu, Haas and Acampora are analogous art because they are from the same field of endeavor of ad hoc networking. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to add a third tier to the combination of Haas and Acampora. This combination discloses a third mesh network tier geographically overlapping the second network and comprising a plurality of third mesh network tier subscriber units and a third mesh network tier sink node unit configured to wirelessly communicate with the primary third mesh network tier unit (the cluster heads of each second tier network would form a third tier network); and a connection between the second mesh network tier sink node unit and a third mesh network tier unit capable of communication in the third mesh network tier, whereby one of the second mesh network tier subscriber units is configured to be provided with a communication path via the second network sink node unit to another third mesh network tier unit (the routing between the second and third tiers in this

combination would clearly be the same as that between the first and second tiers (as described in lines 50-59 of column 8 of Haas).

The motivation for doing so would have been to reduce routing complexity at the second tier as suggested by Liu in lines 20-25 of column 14. Therefore, it would have been obvious to combine Liu with the combination of Haas and Acampora for the benefit of reduced routing complexity to obtain the invention as specified in claims 41, 59, and 75.

Regarding claims **42, 60, and 76**, Haas does not disclose expressly a third tier. However, Haas discloses the limitation that wireless communication in the first mesh network tier is independent of wireless communication in the second mesh network tier (see lines 45-46 of column 8). As indicated above, Liu discloses the combination of a third network tier. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Haas and Acampora to add a third tier which is independent of the first and second tiers. The motivation for doing so would have been so that the separate tiers did not interfere with one another.

Regarding claims **43, 61, and 77**, Haas does not disclose expressly the limitation that wireless communication in the first mesh network tier and the second mesh network tier is in a different frequency band from wireless communication in the third mesh network tier.

Acampora discloses the concept of using separate frequencies in each tier of a two-tier network architecture in lines 58-65 of column 6. Haas and Acampora are analogous art because they are from the same field of endeavor of wireless ad hoc networking. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the above combination of Haas, Acampora, and Liu to use a different frequency in each tier of the network.

The motivation for doing so would have been to allow communications at the three tiers to remain separate and not interfere with each other. Therefore, it would have been obvious to combine Acampora with Haas for the benefit of minimizing interference between the tiers to obtain the invention as specified in claims 43, 61, and 77.

Regarding claims **44, 62, and 78,** Haas does not disclose the limitation that the first mesh network tier comprises a plurality of first network sink node units with which the first mesh network tier subscriber units are configured to wirelessly communicate.

Acampora discloses the concept of multiple sink nodes in a tier throughout. In Acampora, the agents are the sink nodes at the first tier and Acampora suggests the use of "one or more proximately-located agents" in the abstract, for example. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the above combination of Haas, Acampora, and Liu to use a plurality of sink nodes in the second tier. The motivation for doing so would have been make the network more robust in the event of a failure of a sink node as well as to reduce the capacity requirements placed upon a single sink node. Therefore, it would have been obvious to modify the above combination of Haas, Acampora, and Liu for the benefit of improved robustness and capacity to obtain the invention as specified in claims 44, 62, and 78.

Regarding claims **45, 63, and 79,** Haas does not disclose expressly the limitations regarding the third tier. However, at the time of the invention, it would have been obvious to apply the teaching of Haas regarding the routing between the first and second tiers (see the plurality of connections in Figure 3 between first tier sink node CH 1 and second tier units CH 2 and CH 4, for example) to that of the second and third tiers. The motivation for doing so would

have been to reduce routing complexity at the second tier as suggested by Liu in lines 20-25 of column 14. Therefore, it would have been obvious to combine Liu with the combination of Haas and Acampora for the benefit of reduced routing complexity to obtain the invention as specified in claims 45, 63, and 79.

Regarding claim **51, 69, and 85**, Haas does not disclose expressly the limitation that the third mesh network tier uses radio communication. However, Haas discloses that all communication in the hierarchical system proposed is radio communications (see claims 30-34 of column 2). At the time of the invention, it would have been obvious to use the same form of communications in the third mesh network tier as in the other two tiers in Haas, as modified. The motivation would have been to maintain the same advantages of the ad hoc network (including robustness and easy and quick reconfigurations of network topology.)

Regarding claims **64 and 80**, Haas discloses throughout the limitation that the communication is data communication. Consider, for example, the discussion in lines 14-36 of column 3 which discussed routing packets which clearly contain data of some type.

Similarly, regarding claims **65 and 81**, Haas discloses the limitation that the communication is packet data communication. Again, consider the discussion in lines 14-36 of column 3 which discussed routing packets which clearly contain data of some type.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT C. SCHEIBEL whose telephone number is (571)272-3169. The examiner can normally be reached on Mon-Fri from 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing F. Chan can be reached on 571-272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Robert C. Scheibel
Examiner
Art Unit 2619

/R. C. S./
Examiner, Art Unit 2619

/Wing F Chan/
Supervisory Patent Examiner, Art Unit 2619
3/24/08